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HAHN AND ASSOCIATES, INC.
ENVIRONMENTAL CONSULTANTS

October 20, 2000

Mr. Rod Struck
Oregon Department of Environmental Quality
2020 SW 4th Avenue, Suite 400
Portland, Oregon 97201-4987

HAI Project No. 5106
ODEQ ECSI File No. 2042

Subject: Addendum No. 1 to Work Plan For Supplemental Site Characterization, Marine Terminal 1 South Redevelopment, 2100 NW Front Avenue, Portland, Oregon

Dear Mr. Struck:

1.0 INTRODUCTION

Hahn and Associates, Inc. (HAI) has prepared this addendum (No. 1) to the Work Plan for Supplemental Site Characterization[1] dated August 31, 2000, for the above-referenced site (Figure 1). This submittal details proposed data gap investigations subsequent to implementation of Phase 1 supplemental site characterization activities. All work activities, unless otherwise specified herein, will be carried out according to the August 31, 2000 Work Plan.

2.0 BACKGROUND

In September 2000, HAI conducted Phase 1 supplemental site characterization activities at the site that included the installation of 33 push probes to determine the extent of identified soil and groundwater impacts in the identified target areas and characterize the impacts to support risk evaluation and/or waste disposal. The results indicate that low level petroleum hydrocarbon impacts to soil are present in B-20 and B-29 areas. In addition, elevated concentrations of petroleum hydrocarbons in soil were identified in the dry well (B-37) area, and in two push probes (B-81 and B-82) next to NW Front Street at the B-38 area. Groundwater impacts were generally defined with the exception of elevated concentrations of PAHs at boring B-77 in the B-38 area.

[1] Hahn and Associates, Inc. (2000). *Work Plan for Supplemental Site Characterization, Marine Terminal 1 South, 2100 NW Front Avenue, Portland, Oregon.* August 31, 2000.

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3.0 PROJECT OBJECTIVES

The objectives of the Addendum No. 1 are to:

- Determine the vertical and lateral extent of petroleum impacts in the vicinity of the dry well (B-37) area.
- Determine the presence of groundwater impacts in the dry well area.
- Gather sufficient constituent data to conduct risk evaluation of petroleum impacts in the dry well area.
- Determine the up-gradient extent of soil and groundwater impacts beneath NW Front Street in the B-38 area.
- Determine the down-gradient extent of groundwater impacts in the B-38 area.
- Perform additional site characterization necessary to expedite the site redevelopment process.

4.0 SITE CHARACTERIZATION PLAN

The site characterization plan for the data gap investigation activities include the following general components:

1) Additional soil and groundwater investigation in the dry well area.

2) Additional soil and groundwater investigation in the B-38 area.

3) Data synthesis and inclusion of data gap investigation results into the focused RI report prepared for the site.

The proposed data gap investigation field program is summarized on Table 1. A summary of the analytical testing and quality assurance / quality control (QA/QC) program is summarized on Table 2. All field activities will be conducted in accordance with the site specific Work Plan (HAI 2000).

4.1 Dry Well (B-37) Area Investigation

B-63 was installed through the bottom of the dry well at the site where diesel and oil-range petroleum hydrocarbons were detected at concentrations up to 3,440 and 10,000 parts per million (ppm) respectively (Figure 2). The data gap investigation is designed to determine the lateral and vertical extent of the detected petroleum impacts, collect additional constituent parameters, and determine if groundwater impacts are present.

Twelve (12) push probes (B-63a through B-67a and B-87 through B-93) will be installed in the area to characterize the extent of previously identified soil impacts at the dry well area. The proposed boring locations are depicted on Figure 2. Boring B-63a will be installed through the bottom of the dry well to determine the vertical extent of contamination. Borings B-64a through B-67a will be installed at previous borings B-64 through B-67 for the collection of additional vertical profiling and petroleum constituent parameters. Borings B-87 through B-93 will be installed in a radial pattern around the dry well at distances of between 35 and 50 feet to determine the lateral extent of soil impacts as well as determine for the presence of groundwater impacts.

The B-37 data gap investigation soil and groundwater sampling programs are summarized in Tables 3 and 4, respectively. Based on field screening observations, additional soil probes, other than those currently proposed, may be installed during this phase of investigation such that the extent of soil impacts may be completely defined during this phase of investigation.

4.2 B-38 Area Investigation

Diesel-range and oil-range petroleum hydrocarbons (up to 34,000 ppm and 1,600 ppm) were detected in the B-38 area at depths ranging from 2.5 to 26 feet bgs (Figure 3). The on-site extent of the soil and groundwater impacts appears to have been determined by previous investigations with the exception of groundwater down-gradient of B-77. The proposed investigation in this area is designed to determine the extent of soil and groundwater impacts beneath NW Front Street, and groundwater impacts down-gradient of B-77.

Ten push probes (B-94 through B-103) will be installed in and/or adjoining NW Front Street to characterize the extent of previously identified soil and groundwater impacts. Due to the presence of underground utilities, B-95 through B-99 will be installed just northeast of the center lane of NW Front Street, and B-100 through B-103 will be installed on the southwestern shoulder of NW Front Street. In addition, two push probes, B-104 and B-105, will be installed in apparent down-gradient locations from B-77 to further characterize groundwater impacts.

Soil samples will be collected from borings B-94 through B-103. The soil sample with the highest concentration of diesel and oil-range petroleum hydrocarbons from each of these borings will be analyzed for PAHs. In addition, groundwater samples will be collected from B-95, B-97, B-99, B-100, B-101, B-102, and B-103. The groundwater samples will be analyzed for PAHs; while only groundwater from boring B-97 will be analyzed for DEHP. The soil and groundwater sampling program is summarized on Tables 3 and 4.

5.0 PROJECT SCHEDULE

The schedule for the data gap investigation activities is as follows:

Activity	Date
B-37 Area data gap investigation	October 24 and 25, 2000
B-38 Area data gap investigation	October 26 and 27, 2000
Data Gap Data Package	November 15, 2000
Draft RI report	November 22, 2000
Final RI report	December 8, 2000

Upon your review, please contact the undersigned or Mr. Joe Mollusky with the Port of Portland with your comments or questions.

Sincerely,

Guy H. Tanz, R.G.
Associate

c: Mr. Joe Mollusky, the Port of Portland

TABLE 1
Data Gap Investigation Field Program Summary

Work Plan Addendum No. 1
Data Gap Investigation
Marine Terminal 1 South
2100 NW Front Avenue
Portland, Oregon

HAI Project No. 5106

Area of Investigation	Description	Proposed Push Probe Borings	Number of Push Probe Borings	Number of Push Probe Borings with Soil Samples	Initial Number of Near-Surface Soil Samples[1] (0-5 feet bgs)	Initial Number of Subsurface Soil Samples [1]	Number of Screening-Level Groundwater Sample Locations
Dry Well Area	Dry well between House No. 104 and Warehouse No. 2 (B-37)	B-63a through B-67a, B-87 through B-93	12	12	4	29	5
B-38 Area	West End Open Storage Area	B-94 through B-103	10	10	10	30	6
		B-104 and B-105	2	0	0	0	2
		Totals -->	24	22	14	59	13

bgs = below ground surface

1 = Additional samples may be selected for analysis based on field screening indicators

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Updated: 10/20/00 GHT
File: 5106 Data Gap Tables

TABLE 2

Phase 1 Analytical Testing Summary

Work Plan Addendum No. 1

Data Gap Investigation

Marine Terminal 1 South

2100 NW Front Avenue

Portland, Oregon

HAI Project No. 5106

Area of Investigation	Investigative Method	Number of Borings	Sample Matrix	Analytical Parameters	Tentative Number of Samples to be Analyzed				
					Investigative Samples	Field QA/QC Samples			Matrix Total
						Duplicate	Trip Blank	Equipment Blank	
Dry Well Area	Push Probe	12	Soil	TPH-Dx	30	1			31
				PAHs	8	1			9
		5	Groundwater	VOCs	5	1	1		7
				PAHs	5	1			6
B-38 Area	Push Probe	10	Soil	TPH-Dx	45	2			47
				PAHs	10	1			11
				Total Lead	1				1
		12	Groundwater	PAHs	9	1			10
				DEHP	1	1			2

Note:

bgs = below ground surface

DEHP = bis(2-ethylhexyl)phthalate

PAHs = polynuclear aromatic hydrocarbons

QA/QC = quality assurance / quality control

TPH-Dx = diesel and oil-range total petroleum hydrocarbons

VOCs = volatile organic compounds

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TABLE 3

Proposed Data Gap Soil Sampling Program

Work Plan Addendum No. 1
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Portland, Oregon

HAI Project No. 5106

Area	Push Probe Boring Numbers	Proposed Boring Depths (feet bgs)	Collect Groundwater Sample	Tentative Number of Soil Samples to be Analyzed per Boring	Soil Sample Method	Tentative Soil Samples Selected for Analysis (feet bgs)	Analytical Parameters
Dry Well Area	B-63a	28	Yes	3	Continuous Soil Core	16.5', 19.0', and 24.0'; others based on field screening	PAHs @ 16.5', TPH-Dx at 19.0' and 24.0'
	B-64a	20	No	3		5.0', 16.5', and 19.0'; others based on field screening	TPH-Dx and PAHs @ 5.0' and 16.0', TPH-Dx @ 19.0'
	B-65a	18.0		2		5.0'and 16.5'; others based on field screening	TPH-Dx and PAHs @ 5.0', PAHs @ 16.5'
	B-66a	24		2		5.0' and 16.0'; others based on field screening	TPH-Dx and PAHs @ 5.0', PAHs @ 16.0'
	B-67a (on loading dock)	24		3		8.0', 19.5', and 22.0'; others based on field screening	TPH-Dx and PAHs @ 8.0' and 19.5', TPH-Dx @ 22.0'
	B-88, B-90, and B-92	24		3		16.5', 19.0', and 24.0'; others based on field screening	TPH-Dx[1]
	B-87, B-89, and B-91	24	Yes	3		16.5', 19.0', and 24.0'; others based on field screening	TPH-Dx[1]
	B-93 (inside House No. 104)	28		3		19.5', 22.0', and 27.0'; others based on field screening	TPH-Dx[1]
B-38 Area	B-94	28	No	4		2.5', 10.0', 20.0', 26.0'; others based on field screening	TPH-Dx[1]; total lead at 2.5'
	B-95, B-97, B-99, B-100, B-101, B-102, and B-103	28	Yes	4	Continuous Soil Core	5.0', 10.0', 20.0', 26.0'; others based on field screening	TPH-Dx[1]
	B-96 and B-98	28	No	4		5.0', 10.0', 20.0', 26.0'; others based on field screening	TPH-Dx[1]
	B-104 and B-105	28	Yes	0		Based on field screening	TPH-Dx[1]

Note:
bgs = below ground surface
PAHs = polynuclear aromatic hydrocarbons
TPH-Dx = TPH method for diesel- and oil-range petroleum hydrocarbons
1 = The highest concentration of TPH-Dx per boring will be analyzed for PAHs

TABLE 4

Proposed Data Gap Investigation Groundwater Sampling Program: Screening-Level Groundwater Samples

Work Plan Addendum No. 1
Data Gap Investigation
Marine Terminal 1 South
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Area	Push Probe Boring Numbers	Proposed Boring Depths (feet bgs)	Estimated Screen Interval (feet bgs)	Tentative Number of Groundwater Samples to be Analyzed	Analytical Parameters
Dry Well Area	B-63a, B-87, B-89, B-91, and B-93	28	24 - 28	5	VOCs, PAHs
B-38 Area	B-95, B-99, and B-100 through B-105	28	24 - 28	8	PAHs
	B-97	28	24 - 28	1	PAHs and DEHP

Note:

bgs = below ground surface

DEHP = bis(2-ethylhexyl)phthalate

PAHs = polynuclear aromatic hydrocarbons

VOCs = volatile organic compounds

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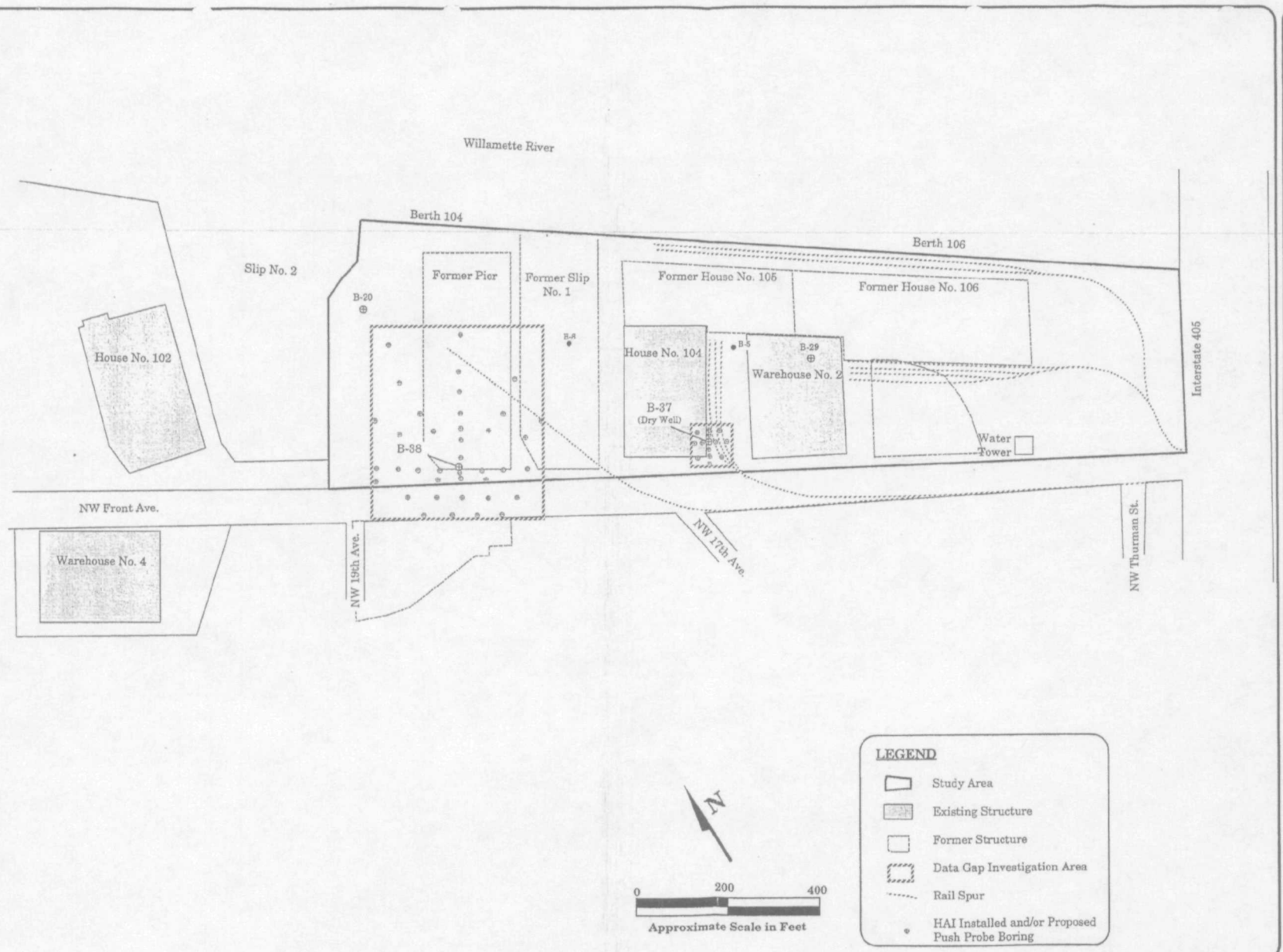

Figure 1

Site Map

Addendum No. 1
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Port of Portland Marine Terminal 1
2100 NW Front Avenue
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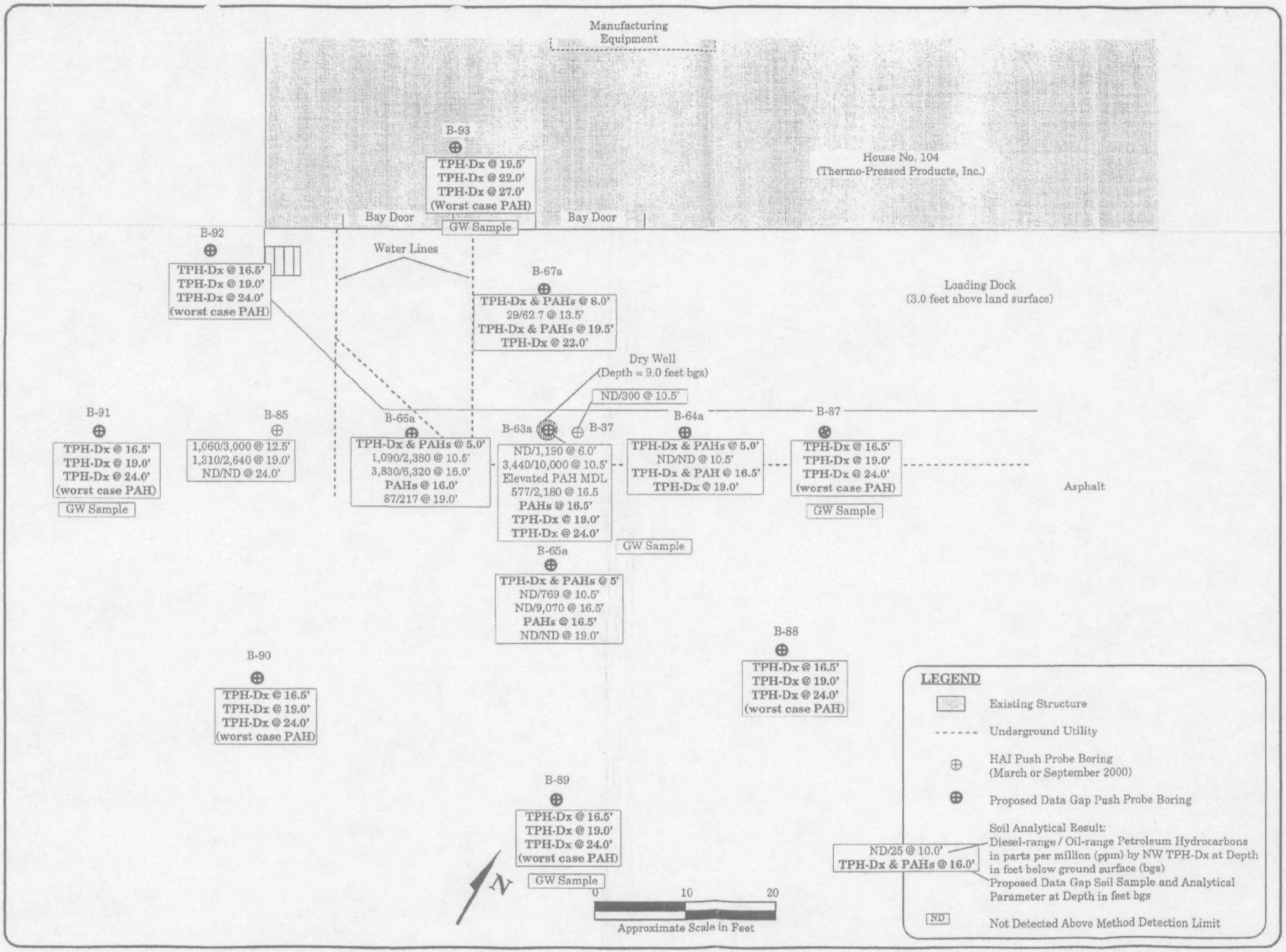

Figure 2

Dry Well Area Proposed Data Gap Investigation Push Probe Locations

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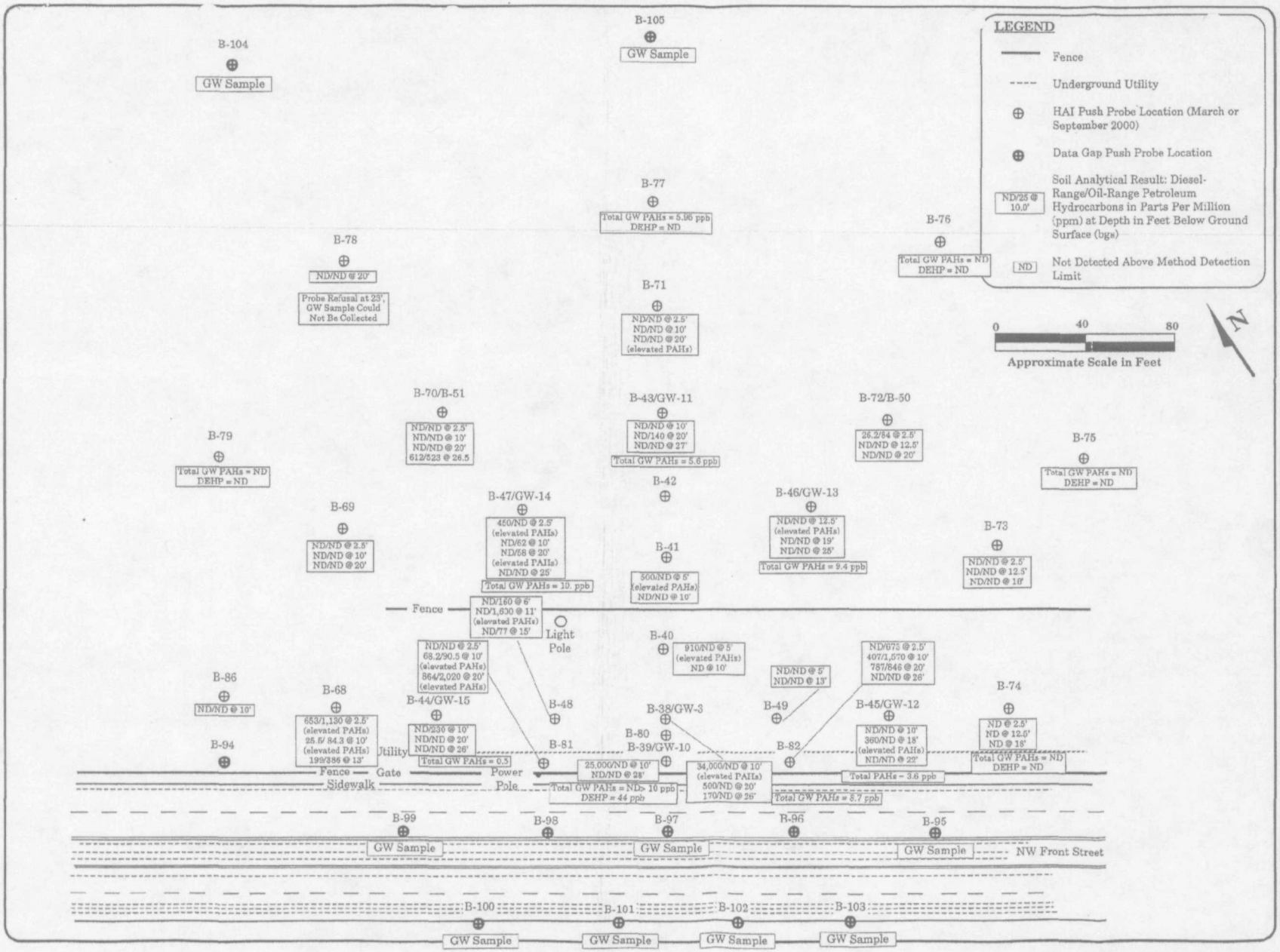

Figure 3

B-38 Area Proposed Data Gap Investigation Push Probe Locations

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